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REMARKS

Claims 21-27 are pending and presented for examination in the subject application. Applicants have hereinabove amended claims 21-23.

Support for the amendments to claim 21 may be found, inter alia, in the specification at page 8, lines 2-9. Further support for the amendments to claim 21 may be found, inter alia, in claim 13 as originally filed.

Applicants maintain that no new matter is presented by this amendment. Accordingly, applicants respectfully request that this Amendment be entered.

Rejection under 35 U.S.C. §112, first paragraph

On page 2 of the April 25, 2001 Office Action, claims 21-27 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Examiner stated that claim 21 recites a method of manufacturing a liquid toner composition for electrophotography. The Examiner also stated that the first step, as it is understood, includes a step of heating a thermoplastic resin within a solvent having certain properties to dissolve and mix the resin with the solvent. The Examiner further stated that the specification as filed does not disclose heating as dissolving and mixing the thermoplastic resin in the solvent. The Examiner stated that the specification does disclose a first "step" as

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having multiple parts: heating, dissolving, mixing, and dispersing the resin in the solvent. The Examiner also stated that the examples at page 14, line 18 show "dispersing" and "mixing" as being accomplished with a stirrer. The Examiner further stated that the claims are not described by the specification because heating is not disclosed as dispersing or mixing the components. The Examiner suggested that the claims be amended to require the necessary steps of dispersing, mixing, and heating to dissolve the components.

The Examiner stated that the claims have been broadened because they no longer require addition of the inorganic particles "immediately" before particle precipitation. The Examiner also stated that this change is described by the specification.

In response, without conceding the correctness of the Examiner's position but solely to advance the prosecution of the subject application, applicants have hereinabove amended claims 21-23. Applicants maintain that the amended claims are adequately supported by and consistent with the specification.

Accordingly, applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 21-27 under 35 U.S.C. § 112, first paragraph.

Rejection under 35 U.S.C. §112, second paragraph

On page 3 of the April 25, 2001 Office Action, claims 21-27 were rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

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The Examiner stated that claim 21 is indefinite because it is unclear if the heating is accomplishing the mixing recited in the passage "to dissolve and mix with the solvent."

The Examiner stated that claim 22 is indefinite because it recites a genus of components (e.g., metal soaps) and then provides examples of specific compounds within the genus (e.g., manganese naphthenate) using "such as" language. The Examiner also stated that the "such as" language is indefinite because it is unclear if the specific compounds are limiting the claim or if the broader genus is limiting the claim. The Examiner further stated that the "such as" language is used repeatedly in the claim and is improper and indefinite at each occurrence. The Examiner suggested that each genus be removed from the claim along with the "such as" language and that only the specific compounds be recited. The Examiner stated that the punctuation should be consistent between each species.

The Examiner stated that claim 23 is indefinite because it is unclear if the dispersant is excluded from being present in an amount of 0.5 to 50% by weight. The Examiner also stated that this issue can be resolved by changing "substances" to "antistat" in both claims 22 and 23 and deleting "excluding the dispersant" from claim 23.

In response, without conceding the correctness of the Examiner's position but solely to advance the prosecution of the subject application, applicants have hereinabove amended claims 21-23. Applicants maintain that the amended claims clearly recite the subject matter applicants regard to be the invention.

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Accordingly, applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 21-27 under 35 U.S.C. § 112, second paragraph.

Rejection Under 35 U.S.C. § 103(a)

On page 4 of the April 25, 2001 Office Action, claims 21-24 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,358,822 to Hou (hereinafter "Hou '822").

The Examiner stated that Hou '822 discloses a process of making a liquid toner. The Examiner also stated that in the process of Example 2 in Hou '822 a thermoplastic polymer and a pigment (e.g., carbon black-an inorganic pigment) are placed in a solvent that is a good solvent for the polymer at high temperatures and a poor solvent at lower temperatures. The Examiner further stated that the polymer and pigment are heated to a temperature where the polymer is dissolved and then cooled so the polymer precipitates with the pigment. The Examiner stated that the precipitated polymer particles are removed from the solvent and then redispersed in ISOPAR and mixed with cupric naphthenate along with a steric stabilizer. The Examiner also stated that Hou '822 states that either organic or inorganic colorants may be used in the process. The Examiner further stated that the colorants, such as a pigment, are either embedded in the particle or are attached to the surface of the particle in Hou '822. The Examiner acknowledged that Hou '822 does not mention the solubility parameter of the solvent. The Examiner alleged that it is apparent from the disclosure and would be understood by the artisan that the solubility parameter is chosen so that the polymer will dissolve out of the solvent and form either a coating on the pigment or a particle with the pigment embedded.

The Examiner also alleged that the artisan would understand that the solubility parameter would control the size of the particle or thickness of the polymer coating on the pigment.

The Examiner acknowledged that Hou '822 does not state that the polymer is substantially insoluble in the solvent at room temperature. The Examiner alleged that it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a combination of polymer and solvent so that cooling can be performed to room temperature rather than 0°C as performed in Example 2 of Hou '822. The Examiner also alleged that this would have been advantageous because cooling to room temperature would require less time and less energy (e.g., an ice bath would not be required). The Examiner further alleged that the artisan would have found it obvious to choose a polymer for the toner in Hou '822 where the solubility temperature is at room temperature for a given solvent to reduce time and expense of toner preparation. The Examiner alleged that the artisan would have been expected to optimize the amounts of the dispersant and naphthenate compound in Hou '822 within the disclosure of the reference in order to obtain optimum characteristics of the toner composition.

Applicants maintain that Hou '822 does not render obvious the invention claimed in the amended claims. The claimed invention is patentable over Hou '822 for at least the following reasons.

Hou '822 discloses how to make a liquid toner for electrophotographic imaging. Hou '822 teaches that a polymer (for example, polyamide) and a pigment are heated up to a selected temperature to dissolve the polymer, and then the

resultant is cooled down so that the polymer precipitates together with the pigment.

In contrast, the present invention relates to a method of manufacturing a liquid toner composition for electrophotography wherein thermalplastic resin is dissolved in a solvent capable of dissolving the thermoplastic resin when heated and substantially incapable of dissolving the resin at room temperature. A SP (solubility parameter) value of the solvent is adjusted to control the particle diameter of toner particles on a basis of a difference between a SP value of the resin itself and the SP value of the solvent, after dispersing and mixing the thermoplastic resin in the solvent while performing stirring, to dissolve the resin in the solvent. The mixture is cooled down to permit precipitation of the toner particles, wherein inorganic fine particles are added to the mixture before initiation of the toner particle precipitation. Such features of amended claim 21 are not described or suggested in Hou '822, and thus the claimed invention is patentable over Hou '822.

The term "solubility parameter" (SP) value is used in the art to express the degree of solubility of a resin (or polymer) when it is dissolved in an organic solvent. The closer the SP value of the resin is to the SP value of the solvent, the more easily the resin dissolves in the solvent.

While Hou '822 and the present invention each relates to a method of manufacturing resin fine particles by cooling down the resin dissolved in an organic solvent to precipitate, the claimed invention provides that the diameter of the resin fine particles precipitated is adjusted on the basis of the difference in the

SP value between the resin and the solvent, which Hou '822 simply does not disclose nor suggest.

The claimed invention provides the advantage that the diameter of the particles may be made uniform by controlling the precipitation, and therefore liquid toner particles having an average grain diameter of 2 to 3 mm, that is, a standard volume and a sharp distribution of graininess, may be manufactured.

Further, Hou '822 does not disclose or suggest that the polymer is not soluble in the solvent at room temperature. In Hou '822 the mixture is cooled down to 0°C in order to induce precipitation, and therefore it is reasonable for one of ordinary skill in the art to infer that the polymer would dissolve in the solvent at room temperature. It is possible to select a combination of a resin and an organic solvent such that the resin does not dissolve in the solvent at room temperature but can dissolve at a higher temperature. However, in order to have particles having a diameter of 2 to 3 mm precipitated in addition to such a combination (a resin and an organic solvent that the resin does not dissolve in the solvent at room temperature but can dissolve at a higher temperature), the SP value of the solvent should be adjusted to control the particle diameter of toner particles on a basis of a difference between an SP value of the resin and the SP value of the solvent, as provided by the present invention. There is simply no such teaching or suggestion in the cited art.

Moreover, the claimed invention provides that the thermalplastic resin is dissolved in the above-described solvent after dispersing and mixing the thermoplastic resin in the solvent

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while performing stirring, to dissolve the resin in the solvent, and then the mixture is cooled down to permit precipitation of the toner particles, wherein inorganic fine particles are added to the mixture before initiation of the toner particle precipitation. This feature of the present invention provides the advantages of a liquid toner with the characteristics of an electric viscous fluid and a liquid toner composition capable of producing a high-quality image of a stable image. Hou '822 simply does not disclose or suggest such special operational effect.

Therefore, Hou '822 fails to teach or render obvious the claimed invention.

Regarding claims 22-24, applicants respectfully point out that claims 22-24 depend on and include all the limitations of claim 21. Thus, claims 22-24 are patentable at least for the reasons set forth above with respect to amended claim 21.

Accordingly, applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 21-24 under 35 U.S.C. § 103.

Rejection Under 35 U.S.C. § 103(a)

On page 6 of the April 25, 2001 Office Action, claims 25-27 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Hou '822 in view of U.S. Patent No. 3,808,026 to Sato et al. (hereinafter "Sato '026").

The Examiner acknowledged that Hou '822 does not disclose silica and titanium oxide as a component of the toner. The Examiner

stated that Sato '026 discloses silica and titanium oxide as a white pigment in a liquid toner. The Examiner also stated that these pigments are effective for forming an image that is non-contrasting with the image background.

The Examiner alleged that it would have been obvious to one having ordinary skill in the art at the time the invention was made to use silica or titanium oxide as the pigment in the liquid toner of Hou '822 because a white pigment in the toner allows for development of the image background. Examiner stated that development of the background area on the photoreceptors permits neutralization of background charges and allows clear images to be formed. The Examiner also stated that it appears that silica would have hydroxide groups attached to its surface because silica is a hydrophilic substance. The Examiner further stated that what absorbed on the silica surface would give hydroxide groups.

Applicants maintain that Hou '822 and Sato '026 do not render obvious the invention claimed in claims 25-27. The claimed invention is patentable over Hou '822 and Sato '026 for at least the following reasons.

As stated above, Hou '822 does not render unpatentable the invention recited in amended claim 21, from which claims 25-27 depend, since Hou '822 fails to disclose or suggest many of the features in the claimed invention. Sato '026 does not cure all the deficiencies of Hou '822.

Sato '026 appears to relate to a method of developing an electrostatic latent image formed on an electrophotographic

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surface.

Sato '026, like Hou '822, fails to disclose or suggest, however, heating a thermoplastic resin within a solvent capable of dissolving said thermoplastic resin when heated and substantially incapable of dissolving said resin at room temperature, an SP (solubility parameter) value of said solvent being adjusted to control the particle diameter of toner particles on a basis of a difference between an SP value of the resin and the SP value of the solvent, after dispersing and mixing said thermoplastic resin in said solvent while performing stirring, to dissolve said resin in said solvent, as set forth in amended claim 21 from which claims 25-27 depend.

Thus, even if the teachings of Hou '822 and Sato '026 are combined together, the combination nevertheless does not disclose or suggest all features in the claimed invention.

In addition, Sato '026 discloses titanium oxide and silica as white pigment for a liquid toner. By contrast, the inorganic fine particles recited in claims 25 to 27 of the subject application are prepared neither for whitening, as in Sato '026, nor as a result of consideration of the development of the background as contended by the Examiner. The objective of adding inorganic fine particles in the present invention is to impart characteristics as an electric viscous fluid to a liquid toner. Thus, the claimed invention provides a method of manufacturing a liquid toner composition capable of producing a high-quality image or a stable image.

In view of the amendments to the claims and remarks hereinabove,

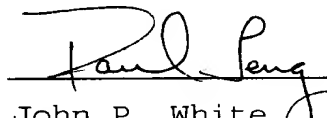
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applicants maintain that claims 21-27 are now in condition for allowance. Accordingly, applicants earnestly solicit the allowance of claims 21-27.

If a telephone interview would be of assistance in advancing prosecution of the subject application, applicants' undersigned attorneys invite the Examiner to telephone them at the telephone number provided below.

No fees are deemed necessary in connection with the filing of this Amendment. However, if any fees are required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,


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I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Box AF, Washington, D.C. 20231.

 July 24, 2001
Paul Teng Date
Reg. No. 40,837

21. (Amended) A method of manufacturing a liquid toner composition for electrophotography, comprising the steps of:

heating a thermoplastic resin within a solvent capable of dissolving said thermoplastic resin when heated and substantially incapable of dissolving said resin at room temperature, an SP (solubility parameter) value of said solvent being adjusted to control the particle diameter of toner particles on a basis of a difference between an SP value of the resin and the SP value of the solvent, [to dissolve and mix with the solvent] after dispersing and mixing said thermoplastic resin in said solvent while performing stirring, to dissolve said resin in said solvent; and

cooling the mixture to permit precipitation of the toner particles, wherein inorganic fine particles are added to the mixture before initiation of the toner particle precipitation.

22. (Amended) A method of manufacturing a liquid toner composition for electrophotography, according to claim 21, wherein said liquid toner composition contains at least one of a dispersant and one or more [substances] ~~antistats~~ selected from the group consisting of nigrosine series dyes, [metal soaps such as] manganese naphthenate, calcium naphthenate, zirconium naphthenate, cobalt naphthenate, iron naphthenate, lead naphthenate, nickel naphthenate, chromium naphthenate, zinc naphthenate, magnesium naphthenate, manganese octylate, calcium octylate, zirconium octylate, iron octylate, lead octylate, cobalt octylate, chromium octylate, zinc octylate, magnesium octylate, manganese dodecylate, calcium dodecylate, zirconium dodecylate, iron dodecylate, lead dodecylate, cobalt dodecylate, nickel dodecylate, chromium dodecylate, zinc dodecylate and

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magnesium dodecylate; [alkylbenzene sulphonates such as] calcium dodecylbenzene sulphonate, sodium dodecylbenzene sulphonate, barium dodecylbenzene sulphonate; [phospholipids such as] lecithin and cephalin; and [organic amines such as] n-decyl amine.

23. (Amended) A method of manufacturing a liquid toner composition for electrophotography, according to claim 22, wherein an amount of said one or more [substances excluding the dispersant] ~~antistats~~ is 0.5 to 50% by weight, based on the amount of solid components of the liquid toner composition.